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9 December 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: GLOBAL ANALYSIS OF TRANSPOSABLE ELEMENTS AS MOLECULAR MARKERS OF CANCER

(57) Abstract: The present invention provides methods of determining expression patterns, methylation patterns and chromatin status patterns for transposable element gene sequences. These methods can be utilized to diagnose, stage and treat cancer.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/13522

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12Q 1/25, 1/68; G01N 33/53

US CL : 435/4, 6, 7.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/4, 6, 7.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|--------------------------|
| A | COSTELLO, J.F. et al. Methylation Matters. Journal of Medical Genetics. May 2001, Vol. 38, No. 5, pages 285-303, especially pages 287, 288 and 296. | 1-9, 11-13, 16-24, 31-39 |
| X | FLORL, A.R. et al. DNA Methylation and Expression of LINE-1 and HERV-K Provirus Sequences in Urothelial and Renal Cell Carcinomas. British Journal of Cancer. July 1999, Vol. 80, No. 9, pages 1312-1321, especially pages 1316-1319. | 1, 2, 4, 8, 16-19 and 22 |
| X, P | SEIFARTH, W. Assessment of retroviral activity using a universal retrovirus chip. Journal of Virological Research. September 2003, Vol. 112, No. 1-2, pages 79-91, especially pages 83 and 89. | 1-4, 6, 8, 31-33 and 35 |



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X"

document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

01 October 2004 (01.10.2004)

Date of mailing of the international search report

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Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

Intern application No.

PCT/US04/13522

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 10,14,15,25-30 and 40-42
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/13522

Continuation of B. FIELDS SEARCHED Item 3:

EAST, MEDLINE, CAPLUS

search terms: transposon, transposable element, ERV, SINE, LINE, expression, microarray, methylation, methylation-specific PCR, chromatin immunoprecipitation, cancer, carcinoma, sarcoma, fibroma, teratoma, blastoma